

## **IN THE CLAIMS**

Please amend the claims to read as follows:

1-54. (canceled)

**74. (new)** A rotary internal combustion engine shaped like an electric motor, comprising a case **2** having cylindrical cavity contains at least flywheel **3** of smooth circumference width, disposed and geared on a straight central crank **6**, to rotate coaxial inside the case therein, the flywheel contains at least a cylinder of piston **41** or many mounted oppositely on centre-side perpendicularly on crank at central line angle  $45^\circ$  or more on flywheel's tangent as opened from this side outwardly on flywheel circumference facing case cavity wall, a piston **42** inside it with ability of flexible linear motion therein linked to the closed end of the cylinder (cylinder base) by a self interlock rods or more enforced by a spring or an elastic device defining piston's push-arm **7**, the piston's top face together with its cylinder's wall and its facing internal cavity's wall defining the combustion chamber **1**, a circular seal **26** surrounding and fixed on wheel circumference **4** at each edge side interlocked with the case, at least three of seal mass **19** facing wheel circular width in a designed fixed radial locations on case cavity to isolate stroke performance modes of a each chamber during rotating of flywheel thereon, each chamber conducted with the rotation to be fed by air-fuel mixture from inlet **20** via valve(s) **22**, to pass on spark plug(s) **9**, for exploding its fuel-mixture charge at a relatively longer zone located away from inlet valves, charge explosion will make its piston deflects or depressed downward transferring power of gases released from the explosion to the flywheel side causing torque to rotating, while passing other radial seal to reach the exhaust opening **30** that contains modified wings designed to provide aerodynamic effects based on employ Bernoulli's Concepts to make speedily exhaust gases expel through out while reflecting relative aerodynamic reaction on the same discharging chamber which will be as a packet for escaping

gases to be pushed back ward i.e. on the direction of flywheel rotation adding more power on the rotation, supported by the already depressed elastic push-arm of the piston therein, then reaching the final release exhaust opening where there is air puffing inlet **21** to clean and scavenge the remaining exhaust gases, to have other new revolution, a compressed air will be fed into feeding inlet **22** after spraying or injecting fuel on it by a device **20**, compressed air feeding for the two inlets **21** and **22** by one network of accessories having air store and a compressor, an ignition distributor **33** conducted with crank rotation adapted to link with the spark plug(s), Inlet valves **21**, **22** mechanically timed controlled by edge(s) of circular metal pad(s) **17** which surrounding and coinciding sides of each flywheel which also used for oil transport and cooling services containing radius grooves to discharge oil outwardly from inlets at central oil canal **24** to link the case, depending on centrifuge concept during engine rotation, piston oil servicing via canal passes through piston push-arm **7** discharged relatively by sliding rod-pump **10** works with piston linear up and down motion, linking piston's internal oil network with its flywheel oil intake via holes on central straight crank thereon, oil returns back via case network by discharge and gravity to main oil tank **35** at one end of the engine where a normal oil pump is there to supply the central canal in the crank, a case could be disciplined to have many said flywheels with different dimensions each one could work as a separate independent power unit in the engine controlled by independent accessories to form an automatic engine .

75. **(new)** The engine characterised as in claim 1, further, composing three types of combustion system as Piston, Rotary and Turbine, in which all together could perform typically in a compound integral associated unit designed in a simple mechanism to provide best utility of fuel potential combustion energy to transfer it into automotive power output.
76. **(new)** The engine characterised as in claim 74, further, using a new technique of concentrating the reactions of Kinetics energies appeared as physical dynamic forces occurred in/by elements motion inside the engine, to be used positively on engine output benefit.

77. **(new)** The engine characterised as in claim 74, further, does not have energy-lost stroke, all piston displacements in any direction will act positively for the output benefit during performance that will provide potential power for the engine.
78. **(new)** The engine characterised as in claim 74, further, using speedy exhaust gases to create potential aerodynamic reactions by using a technique of aerodynamic concept at a modified exhaust openings to reflect a relative power positively for a benefit of output.
79. **(new)** The engine characterised as in claim 74, further, using pre-compressed air-fuel mixture to boost it vertically on the axis of modified flywheel(s) contains flexible piston(s) chamber(s) which in a stage could be similar to a "firework wheel" to let the flywheel works like a turbine rotates by escaping gases from its chambers in this spark engine, while utilising many efficient concepts together with fuel combustion to provide different characteristics some from piston system as economic and easily controlled engine and others from a turbine ( or Jet) system as a speedily accelerated with powerful output engine, to establish connecting principle on that wide gap between piston engines and turbine (or Jet) engines by this compact system.
80. **(new)** The engine characterised as in claim 74, further, using the pre-compressed air-fuel mixture to charge it by almost independent device ( separated from engine activities) to be boost (or supercharging it ) to the chambers which efficiently will provide best status for fuel mixture for combustion at all cases since it will easily controlled to be in right time for squeezing the power on pistons and on having rapid accelerated engine.
81. **(new)** The engine characterised as in claim 74, further, using the principle of Puffing air on each chamber i.e. piston cup directly at the end of exhaust stroke while still hot for expelling (scavenging) exhaust gases, to reduce heat of chambers in each cycle, providing a perfect controlled adiabatic effect, for exiting all remaining exhaust gases and cleaning what could be left of soot, even the pressure and temperature of this external air feeding could be controlled, this mission could be repeatedly done in highly speed perfectly in each double revolution of any

chamber automatically, consecutively and harmonically with other chambers, since the system providing such ability of independent performance.

**82. (new)** The engine characterised as in claim 74 and relatively to claim 8 further, is using a built-in technique to reduce the pollution of exhaust gases within the engine, by puffing pressured air directly on the hot gases in each chamber while still hot at each end of its exhaust stroke, which will complete the oxidisation of all exhaust gases i.e. those sensitive gases CO & NO<sub>x</sub> (and SO<sub>x</sub> if exist) to be oxidised into environment-friendly status before being expelled to the environment , it is also a way to prevent acid rains, this mission could be controlled by adding extra pollution-treating factors.

**83. (new)** The engine characterised as in claim 74, further, using flexible elastic push-arms for pistons with the free various elastic displacements as this discipline utilises them all positively and effectively on the engine output, by a way of maintaining a perfect fuel combustion in each chamber, by providing exactly the required extension for chambers space to act in association with other engine effects as this is a flexibility of this system to use any mix rate (different compression effect) upon any piston while engine in performance, it could use different fuel (in octane factor) without a mechanical disturbance, keeping an actual required chamber's combustion space for any fuel, keeping a best firing situation for any fuel efficiency to be utilised, terminating knocking, rumbling problems, this system is providing a flexible harmonic distribution even for differential fuel combustion intensities in any of the chambers to be transferred all positively to the engine automotive output power.

**84. (new)** The engine characterised as in claim 74, further, is using easy way of feeding the air-fuel mixture to each chamber as in the same (uniform) ideal mixture for all by one fuel spraying mechanical device to feed all chambers , or by using a separate (independent) spraying devices for automatic control feeding for each piston unit ( or group of pistons) separately in this system to have precise required fuel in any application performance.

**85. (new)** The engine characterised as in claim 74, further, is using a specific principle of distributing oil services from central supply canal(tunnel) inside its

straight crank via metal pads by utilising the Centrifugal concept on engine rotation, for discharging oil outwardly to engine case, providing good adiabatic efficiency with good oil distribution to engine parts related to its speed, the engine oil tank far from hot combustion gases of chambers preventing expected oil smoke due to penetrating of these gases leakage on oil sump.

**86. (new)** The engine characterised as in claim 74, further, is using independent device for oil service in each pistons by its private pump working relatively to the piston's displacement, supplying the required oil quantity for each piston, (for piston wall touching cylinder wall) independently as the piston demands.

**87. (new)** The engine characterised as in claim 74, further, is using simple mechanism to bear any power range by transferring it to a sliding free rotating reaction by a straight crank mounted on it wheel(s) consisting piston(s) of flexible elastic displacements, the additional effective reactions which acting positively on engine output by employing a criteria of this system in utilising the advantages of this circular shape of wheel(s) in the engine could be called additional spherical sustained reaction of this system on the said fuel output.

**88. (new)** The engine characterised as in claim 74, further, has ability of conducting parts of engine performance needed for any engine application, maintaining sufficient independent parts of engine in work as needed for the required engine output, by the ability in using independent feeding devices for each engine part, providing the exact consumption to reduce fuel for any work.

The engine characterised as in claim 74, further, having the ability of providing auto-

output performances, by ability of controlling any piston performance, any piston could

work or stops as required during engine rotation, despite they are on the same crank, this

would be happened without influencing on other parts in the engine, related to engine

design concerning the pistons and/or wheels numbers in engine, and a control of the

accessories, to provides the pioneer characteristic of automatic system ;''Shirwan S.''

**89. (new)** The engine characterised as in claim 74, further, is using a specific design of the free flexible elastic push-arm for pistons, with chambers placed in the wheel outwardly circumference, employing the circular shape with its miracle physical advantages in reducing the linear movement of working pistons due to increasing rotary speed of wheel(s) inside engine, the piston's depress decreases with the increase of revolution speed depending on a natural concept of a dynamic circular body rotating and accelerates by consecutive linear force(s) effects on the same rotary direction which will not stay as the same premier force(s) effect while increasing wheel rotary speed or to keep a constant speed , this criteria will be used to reduce linear force of piston(s) acting on a wheel which would be used to reduce the fuel needs required for the consecutive explosions in chamber(s) having reduction in its expanding, due to reductions of piston(s) displacements, means this system as it is boosting(charging) air-fuel to engine, it will reduce its fuel consumption while increasing its speed by utilising the speed-factor in this physical concept.

**90. (new)** The engine characterised as in claim 74, and relatively to claim 17, further, is using the principle of utilising Centrifugal concept directly in highly speeds, to reduce the fuel consumption also, as this connected with the circular placing of the chambers with free movement of all pistons related with the weight of pistons masses and an assumption existing mass for the gases in these chambers, while keeping the same reaction on the wheel(s), at highly various revolution speeds, physical centrifugal reaction will be reflected by gas pad as a balloon inside these mentioned chamber(s) to act again on the same positive direction of fuel combustion inside the engine, this means extra descending in the said fuel consumption with the speed increase in this engine, it means this is a second way of countering the fuel consumption while increasing the speed, the indicator diagram for both claim 747&18 would be used in approaching a theoretical situation of minimum piston linear reciprocated displacement to program a computer control

system for actual required feeding to reduce the fuel consumption that needs in highly speed, related to the engine & loading.

**91. (new)** The engine characterised as in claim 74, further, is using valves for chambers, controlled separately without using the essential articulated timing connection, e.g. a cam-shaft, this integral system is cancelling the main old slipping stress bearing points those exist on conventional engine's crank and cancelling those articulated parts and their weight in this new engine.

**92. (new)** The engine characterised as in claim 74, further, has a discipline seated to provide facile ways in regulating and adjusting all engine activities, i.e. control of fuel consumption, output power, pollution treatment quality, the pre-heating of the engine, oil-cooling system, the use of aerodynamic power in output and the termination of the defected piston, the contact status of radian seal in Case with wheel(s) as could be controlled mechanically or by thermal adjustment in relation to engine speed or when to be in used for Auto-Engine.

**93. (new)** The engine characterised as in claim 74, further, could be modified easily for various kind of power output, if keeping the same general dimensions, by only changing the qualification of elastic push-arm for group of pistons or all, with little changes in the fuel mixture feeding device(s) if required that is because of the free circular sliding discipline of the engine to bear any range of potential power and more it is depending on piston elastic push-arms.

**94. (new)** The engine characterised as in claim 74, further, could be in wide options depending on this system principal, for various proposals as different in power wheel numbers or diameters, cylinders(piston) diameters or cylinder numbers in each wheel, or even in dimensions of all these in one engine for the wide application Auto Engine, a connected hydraulic system for two pistons in one wheel could be used also to exceed expelling of exhaust gases more rapidly, a differential cross-diameter for metal spring could be used.

**95. (new)** The engine characterised as in claim 74, further, could be used vertically as its crank in vertical direction as a vertical engine performance, that is because the oil services here are depending mainly on the Centrifugal concept, and the air-fuel is boosting to the engine the speedy output efficiency would make this integral

compact engine system is a suitable for the promising small Hoover Craft or other flying equipment . (Fig 23/25).

**96. (new)** The engine characterised as in claim 74, further, could be designed in a dual or more ignition spark plugs in big diameters wheels, depending on the same system principal considering all the requirements, the exhaust openings could be placed as required or even used with moving adjustments

**97. (new)** The engine characterised as in claim 74, further, could be used easily as a group of different-power unites (engines) on the same crank, to work as one engine for heavily application(generations) each engine could have its own oil services and control, to work or stop without influencing on other because of the sliding rotary design with independent effects of parts.

**98. (new)** The engine characterised as in claim 74, further, could use gasoline (benzene) in different kind of octane or Jet kerosene or even Gas fuel in the same principal, the existing of flexible piston push-arm could provide this capability, by just changing the feeding accessories or pistons push-arm.

**99. (new)** The engine characterised as in claim 74, further, however controlled by its magnitude of fuel feeding, this engine could be an Auto-engine unite for multilateral-purposes in performance by providing it with different proposals of modifications as ,

- A /* Air-fuel mixture feeding pipe with controlled regulator inlet for feeding piston of each flywheel (the pistons in any wheel- unit ) by adding management control ,
- B/* Air-fuel mixture feeding pipes with controlled regulator inlet for each wheel unit ,
- C/* Different pistons diameters for any wheel with their particular accessories,
- D/* Different pistons numbers in any wheel with the required modified distributor ,
- E/* Different wheels diameters with their particular required feeding accessories,
- F/* Different piston push-arms (elastic resistance) for any wheel(s) that might be used in a specific way of application - as wheel unit(s)- for fast acceleration, high speed or in extra heavily work or idle work, or related to other kind of fuel that may be used,
- G/* Exhaust opening places, angles, its wings direction could be moveable or regulated for any/all flywheels, as required and the even the location of the last seal before exhaust zone,



**100. (new)** The engine characterised as in claim 74, further, is using a maximum fuel potential energy in output to be transferred to powerful automotive output because of ,

*A /* Its longer effect and constant moment of piston Power stroke on Crank,

*B /* Its pistons strokes, acting all positively on engine output; no stroke lost,

*C /* Its minimum combustion energy lost due to its sliding rotary mechanism all the way,

*D /* Its utilisation of the potential elastic effect of many elements inside the engine,

*E /* Its utilisation of a perfect combustion for air-fuel mixture in chambers all the time,

*F /* Its way of using the pressurized boosted air-fuel mixture into the chambers,

*G /* Its utilisation of the aerodynamic power affect for exhaust gases in its output,

*H /* Its utilisation of the physical powers positive reactions occurred inside the engine,

**101. (new)** The engine characterised as in claim 74, this engine is suitable for a computer age since its parts perform independently to be easily fit an informatics programs.

**102. (new)** The engine characterized as in claim 74, further, the engine has safe high speed efficiency since more speed would cause less vibration (i.e. less distance of pistons displacements) with high adiabatic efficiency, it has a simple fuel spraying devices, it could eliminate gear transmission e.g. in a vehicle if used as Auto Engine, this system has quite wide options since it could use those various elastic devices already used in refill the usual automatic weapons gun/machine such as fast canons to enable changes those products into mankind peaceful civil purposes.

**103. (new)** An internal combustion engine comprising: a engine in the shape of electric motor, this engine comprising a case 2 having a cylindrical cavity comprising a central main crankshaft 6 disposing at least a flywheel 3, centrally mounted and geared thereon has external smooth circumference width to rotate coaxial therein its case, one or more cylindrical space is inside the flywheel on center-side has a plan of its central axis perpendicular on wheel's central line thereof defining a cylinder 41 with one side of its end length opened outwardly on angle 45° or more at its wheel's tangent, a piston 42 to move inside it fixed with the closed end of said cylinder by an

elastic spring to provide deferential free linear movement for the piston due to resisting any stress while consisting a means to form a rod pump therein for servicing oil into piston wall thereon, defining piston's push-arm 7, the vacuum which is surrounded by piston's chamber 1, circular non-penetrated seals 26 fixed and to be interlocked on two side edges of flywheel circumference 4 with the case, three or more groups of seal mass 19 affixed on a radial location on case cavity facing and contacting the flywheel circumference width designed to isolate each revolution into three zones or performance modes relatively to the chamber as conducted by its flywheel rotating therewith, a rotation is to have a chamber firstly be fed with air-fuel mixture by inlet 20 via inlet valve 22 in a feeding zone, to pass secondly on sparking or ignition zone of plug(s) 9, to exploding its fuel-mixture to act on its piston by a stress to depress it downward while resisting it by its piston's push-arm while transferring a potential force to its cylinder bas to act as a side force on its flywheel thereon causing a rotation power, then a chamber will pass thirdly on exhaust zone of opening 30 on the facing case cavity wall which contains wings aligned y to remove escaping gases from its flywheel chamber with inlet valve 21 for puffing air to scavenge and to clean said chamber from its remaining exhaust gases, these performances will be repeated for each chamber as its revolution will continue, while pressured air-fuel mixture is to be fed to the chamber(s) using compressor that has air store and working in association of its engine to supply this feeding mission and the puffing mission done by a network of pipes, a fuel spraying device 20 as carburetor, or by fuel injecting device with other accessories, ignition distributor 33 associated with crankshaft rotation, inlet valves 21, 22 have their relevant mechanical timing control by edge(s) of circular light metal pad(s) 17 which is mounted surrounding each side of its flywheel and coinciding with it, used also for oil and cooling services containing radius grooves to discharge oil outwardly from the central oil canal 24 inside a central oil supply canal servicing engine parts including the piston(s) via its rod pump 10 in its push-arm 7 working relatively downwardly and upwardly with its motion, linked by a central oil canal via flywheel oil intake hole, serving oil to piston to flows back via flywheel side outlet to its side pad to outwardly case by implementing centrifuge concept, while cooling the case returning to the main oil tank 35 which has an opening to the atmosphere to allow using the centrifugal concept, which uses a flexible elastic push-arm for pistons with chambers placed on circular zone on flywheel(s) circumference and which has a connected hydraulic system for two pistons in one wheel.

104. (New) The engine designed as in claim 103, in which said engine uses gasoline for a fuel.

105. (New) The engine designed as in claim 103, in which said engine has an air-fuel mixture feeding pipe has controlled inlets to feed each pistons of the engine (the piston in any flywheel-unit) by valve regulator or management.